

## CLAIMS

What is claimed is:

- [1]** A gallium-nitride semiconductor substrate, characterized in that metal contamination on the substrate surface is  $10 \times 10^{11}$  atoms/cm<sup>2</sup> or less.
- [2]** A gallium-nitride semiconductor substrate, characterized in that metal contamination on the substrate surface is  $5 \times 10^{11}$  atoms/cm<sup>2</sup> or less.
- [3]** A method of manufacturing a gallium-nitride semiconductor substrate, characterized in that in order to remove a process-transformed layer resulting from polishing, dry etching using a halogen plasma is carried out; and wet etching by means of an etchant having no Ga-face and N-face selectivity, having etching ability, and having an oxidation-reduction potential of 1.2 V or more is carried out; whereby contaminant metal produced by the dry etching is removed.
- [4]** A method of manufacturing a gallium-nitride semiconductor substrate, characterized in that wet etching by means of an etchant that is one of HF + H<sub>2</sub>O<sub>2</sub>, HCl + H<sub>2</sub>O<sub>2</sub>, H<sub>2</sub>SO<sub>4</sub> + H<sub>2</sub>O<sub>2</sub>, HNO<sub>3</sub> + H<sub>2</sub>O<sub>2</sub>, HF + O<sub>3</sub>, HCl + O<sub>3</sub>, H<sub>2</sub>SO<sub>4</sub> + O<sub>3</sub>, HNO<sub>3</sub>, or HNO<sub>3</sub> + O<sub>3</sub>, and that has an oxidation-reduction potential of 1.2 V or more is carried out.
- [5]** A method of manufacturing a gallium-nitride semiconductor substrate as set forth in claim 3 or 4, characterized in that a wash for taking off organic matter by means of an organic solvent, and a wash by means of an alkaline solution in order to take off nonmetal contaminants are carried out either before or after the wet etching.